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1 [Query evaluation techniques for large databases](#)

Goetz Graefe

June 1993

ACM Computing Surveys (CSUR), Volume 25 Issue 2

Full text available: [pdf \(9.37 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [reference](#)

Database management systems will continue to manage large data volumes. Thus, efficient algorithms will be required to provide acceptable performance. The advent of object-oriented and extensible modern data models exacerbate the problem: In order to manipulate large sets of complex object records, query-processing ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database operator model of parallelization, parallel algorithms, relational database systems, set-matching a

2

[External memory algorithms and data structures: dealing with massive \(](#)

Jeffrey Scott Vitter

June 2001

ACM Computing Surveys (CSUR), Volume 33 Issue 2

Full text available: [pdf \(828.46 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [reference](#)

Data sets in large applications are often too massive to fit completely inside the computers internal memory. The gap between fast internal memory and slower external memory (such as disks) can be a major performance bottleneck in the design and analysis of external memory (or EM) algorithms and data structures, where the goal is to consider a variety of ...

Keywords: B-tree, I/O, batched, block, disk, dynamic, extendible hashing, external memory, hierarchical memory, online, out-of-core, secondary storage, sorting

3 [Searching in high-dimensional spaces: Index structures for improving the performance of multimedia](#)

Christian Böhm, Stefan Berchtold, Daniel A. Keim

September 2001

ACM Computing Surveys (CSUR), Volume 33 Issue 3

Full text available: [pdf \(1.39 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [reference](#)

During the last decade, multimedia databases have become increasingly important in many applications.

biology. An important research issue in the field of multimedia databases is the content-based retrieval of videos. However, in contrast to searching data in a relational database, a content-based retrieval system requires the database system ...

Keywords: Index structures, indexing high-dimensional data, multimedia databases, similarity searching

4 Inverted files versus signature files for text indexing

Justin Zobel, Alistair Moffat, Kotagiri Ramamohanarao

December 1998 **ACM Transactions on Database Systems (TODS)**, Volume 23 Issue 4

Full text available:  [pdf\(243.62 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

Two well-known indexing methods are inverted files and signature files. We have undertaken a detailed study of text indexing, paying particular attention to query evaluation speed and space requirements. We describe our experimentation and a refined approach to modeling of signature files, and demonstrate that inverted files can be used to evaluate ...

Keywords: indexing, inverted files, performance, signature files, text databases, text indexing

5 Searching in metric spaces

Edgar Chávez, Gonzalo Navarro, Ricardo Baeza-Yates, José Luis Marroquín

September 2001 **ACM Computing Surveys (CSUR)**, Volume 33 Issue 3

Full text available:  [pdf\(916.04 KB\)](#)



Additional Information: [full citation](#), [abstract](#), [references](#)

The problem of searching the elements of a set that are close to a given query element under some distance function is a common problem in many branches of computer science, from pattern recognition to textual and multimedia information retrieval. A similarity criterion defines a metric space, instead of the more restricted case of a vector space. In this paper, we study cases without cross ...

Keywords: Curse of dimensionality, nearest neighbors, similarity searching, vector spaces

6 Computing curricula 2001

September 2001 **Journal on Educational Resources in Computing (JERIC)**


Full text available:  [pdf\(613.63 KB\)](#)  [html\(2.78 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index](#)

7 Pen computing: a technology overview and a vision

André Meyer

July 1995 **ACM SIGCHI Bulletin**, Volume 27 Issue 3

Full text available:  [pdf\(5.14 MB\)](#)


Additional Information: [full citation](#), [abstract](#), [citations](#)

This work gives an overview of a new technology that is attracting growing interest in public as well as in academia. Other technologies in the use of a pen or pencil as the primary means of interaction between a user and a computer interface metaphor. From this follows a set of consequences that will be analyzed and put into context with a short historic ...

8 Bitmap index design and evaluation

Chee-Yong Chan, Yannis E. Ioannidis

June 1998 **ACM SIGMOD Record**, Proceedings of the 1998 ACM SIGMOD international conference on Management of data

Full text available:  [pdf\(1.44 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

Bitmap indexing has been touted as a promising approach for processing complex adhoc queries in database systems. Nevertheless, only few possible bitmap schemes have been proposed in the past and very few have been evaluated ...

In this paper, we present a general framework to study the design space of bitmap indexes for several characteristics that the various algorithms have...

9 On randomization in sequential and distributed algorithms

Rajiv Gupta, Scott A. Smolka, Shaji Bhaskar

March 1994

ACM Computing Surveys (CSUR), Volume 26 Issue 1

Full text available: [pdf\(8.01 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

Probabilistic, or randomized, algorithms are fast becoming as commonplace as conventional deterministic algorithms have been widely used in the design of randomized algorithms. These techniques are illustrated and distributed—that span a wide range of applications, including: primality testing (a classical problem)

Keywords: Byzantine agreement, CSP, analysis of algorithms, computational complexity, dining philosophers, isomorphism, hashing, interactive probabilistic proof systems, leader election, message routing, non-deterministic techniques, randomized or probabilistic algorithms, randomized quicksort, sequential

10 Integrated document caching and prefetching in storage hierarchies based on Markov-chain

Achim Kraiss, Gerhard Weikum

August 1998

The VLDB Journal — The International Journal on Very Large Data Bases,

Full text available: [pdf\(603.01 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [citations](#)

Large multimedia document archives may hold a major fraction of their data in tertiary storage. In this paper, we propose an approach to the vertical data migration between the tertiary, secondary, and primary storage in terms of the latency of the tertiary storage, with the replacement policy of the document caches at the second level, and the interaction of these policies with ...

Keywords: Caching, Markov chains, Performance, Prefetching, Scheduling, Stochastic modeling, Storage hierarchies

11 The Quadtree and Related Hierarchical Data Structures

Hanan Samet

June 1984

ACM Computing Surveys (CSUR), Volume 16 Issue 2

Full text available: [pdf\(4.87 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

12 Data clustering: a review

A. K. Jain, M. N. Murty, P. J. Flynn

September 1999

ACM Computing Surveys (CSUR), Volume 31 Issue 3

Full text available: [pdf\(636.24 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

Clustering is the unsupervised classification of patterns (observations, data items, or feature vectors) in data which are not addressed in many contexts and by researchers in many disciplines; this reflects its broad appeal. However, clustering is a difficult problem combinatorially, and differences in assumptions and constraints can lead to different clustering results.

Keywords: cluster analysis, clustering applications, exploratory data analysis, incremental clustering, pattern recognition

13 Resolving conflicts in global storage design through replication

R. H. Katz, E. Wong

March 1983

ACM Transactions on Database Systems (TODS), Volume 8 Issue 1

Full text available: [pdf\(1.68 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

We present a conceptual framework in which a database's intra- and interrecord set access requirements are modeled and resolved through replication.

characteristics ("evaluated," "indexed," "clustered," "well-placed") to logical access paths. We der structure that most closely provides the desired access characteristics. We use explicit replication


Keywords: access path selection, functional data model, storage structure choice

14 Designing and mining multi-terabyte astronomy archives: the Sloan Digital Sky Survey

Alexander S. Szalay, Peter Z. Kunszt, Ani Thakar, Jim Gray, Don Slutz, Robert J. Brunner

May 2000

ACM SIGMOD Record , Proceedings of the 2000 ACM SIGMOD international

Full text available:  [pdf\(429.09 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [reference](#)

The next-generation astronomy digital archives will cover most of the sky at fine resolution in ma infrared. The archives will be stored at diverse geographical locations. One of the first of these pr wavelength catalog over 10,000 square degrees of the sky (see <http://www.sdss.org/>). The 200 r numerical attribut ...


Keywords: Internet, archive, astronomy, data analysis, data mining, database, scalable

15 Performance issues: A heuristic approach to attribute partitioning

Michael Hammer, Bahram Niamir

May 1979

Proceedings of the 1979 ACM SIGMOD international conference on Manag

Full text available:  [pdf\(1.22 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [reference](#)


One technique that is sometimes employed to enhance the performance of a database managemen of dividing the attributes of a file into separately stored subfiles. By storing together those attribu by separating those that are not, attribute partitioning can reduce the number of pages that are t processing of a tran ...

16 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997

Proceedings of the 1997 conference of the Centre for Advanced Studies or

Full text available:  [pdf\(4.21 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [reference](#)


Understanding distributed applications is a tedious and difficult task. Visualizations based on proci understanding of the execution of the application. The visualization tool we use is Poet, an event i diagrams are often very complex and do not provide the user with the desired overview of the ap occurrences of non-trivial commun ...

17 External memory algorithms

Jeffrey Scott Vitter

May 1998

Proceedings of the seventeenth ACM SIGACT-SIGMOD-SIGART symposium or

Full text available:  [pdf\(1.68 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index term](#)


18 Extensible file system (ELFS): an object-oriented approach to high performance file I/O

John F. Karpovich, Andrew S. Grimshaw, James C. French

October 1994

ACM SIGPLAN Notices , Proceedings of the ninth annual conference on Ob

applications, Volume 29 Issue 10

Full text available:  [pdf\(1.84 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [reference](#)


Scientific applications often manipulate very large sets of persistent data. Over the past decade, a been outpaced by advances in the performance of the rest of the computer system. As a result, n run-times are dominated by the time spent performing I/O operations. Consequently, the perform performance in these applicatio ...

19 Semistructured Data: Structural proximity searching for large collections of semi-structured c

Michael Barg, Raymond K. Wong

October 2001

Proceedings of the tenth international conference on Information and kno

Full text available:  pdf(1.92 MB)

Additional Information: [full citation](#), [abstract](#), [reference](#)


The richness of the XML data format allows data to be structured in a way which precisely capture the data, however, which forms the basis of all XML query languages. Without at least some notice This problem is compounded when one considers that heterogeneous data adhering to different standards paper proposes a solution ...

20 Multidimensional access methods

Volker Gaede, Oliver Günther

June 1998

ACM Computing Surveys (CSUR), Volume 30 Issue 2

Full text available:  pdf(1.05 MB)

Additional Information: [full citation](#), [abstract](#), [reference](#)

Search operations in databases require special support at the physical level. This is true for conventional search operations include the point query (find all objects that contain a given search point) and the region). More than ten years of spatial database research have resulted in a great variety of multi




Keywords: data structures, multidimensional access methods

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